

Effect of Breathing Technique of Blowing versus Perennial Warm Compresses during The Second Stage of Labor on Birth Outcomes among Primipara.

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Abstract:

Background: Childbirth is a pleasant event yet a challenging period for all mothers. It entails physical challenges such as loss of perineal integrity, and perineal trauma. Perineal trauma had been reported as a major distress for laboring women. However, there is a scarcity of empirical data to substantiate interventions aimed at mitigating its impact. *The study aimed to* determine the effect of the breathing technique of blowing versus perennial warm compresses during the second stage of labor on birth outcomes among primipara. **Design:** A quasi-experimental research design was used. **Sample:** A convenient sample of 60 participants were recruited and divided into two study groups (30 for each). **Setting:** at the labor and delivery unit at Rashid General Hospital, affiliated to the Ministry of Health. **Two tools** were used for data collection: **Tool I:** Basic data structured interview schedule, which included socio-demographic characteristics, reproductive history, history of current pregnancy and clinical assessment. **Tool II:** Birth outcome assessment sheet. **Results:** This study reported that 93.4% of the warm compresses group had more intact perineum than the blowing technique group (60%), with a statistically significant difference between both groups ($P = < 0.009$). Also, there was no statistically significant difference between the two groups regarding the duration of the second stage of labor and progress of labor ($p = 0.934$ & $p = 0.553$ respectively). **Conclusion:** This study concluded that both the blowing breathing technique and the warm compresses application yield positive effects on birth outcomes in terms of the progress of labor, the duration of the second stage of labor, and fetal birth outcomes. However, the application of perineal warm compresses demonstrates a greater positive effect compared to the blowing breathing technique concerning perineal integrity. **Recommendation:** The perineal warm compresses should be recommended during the second stage of labor to maintain the perineal integrity.

Keywords: Breathing technique of blowing, perennial warm compresses, second stage of labor, birth outcomes, primipara.

Introduction:

Childbirth is a pleasure event, and it is considered a transitional life experience for women and their families. The impact of this crucial period can be hopeful and empowering, or distrustful and traumatizing. Childbirth refers to a sequence of events occurring in the genital tract to expel the viable components of conception (fetus, placenta, and membranes) from the uterus through the vaginal canal. In broad terms, the process of labor is typically categorized into four distinct stages: the first,

second, third, and fourth stages (Cunningham et al., 2018).

The definition of the second stage of labor encompasses the period starting from the moment the cervix achieves complete dilatation, which is typically at 10 centimeters, until the delivery of the baby. Its occurrence is frequently defined by regular and frequent contractions of the uterus, leading the woman to experience sensations of pressure in the vaginal and rectal areas, accompanied by a strong desire to bear down. Throughout this stage, the mother's pushing efforts aid in the descent of the fetus as

it undergoes the cardinal labor movements, rotating and moving down within the mother's pelvis. Consequently, various complications might emerge in the second stage of labor, such as injuries to the reproductive tract, which are more likely to happen in normal vaginal delivery and are recognized to be more prevalent among women giving birth for the first time (Swier, 2021).

The most common problems that arise during this stage are prolonged second stage (dystocia), fetal birth injuries, and perineal trauma.

Perineal trauma refers to any injury to the genital tract during the delivery process. It is classified as spontaneous perineal trauma, which is called non-intended trauma. In contrast, the intended trauma is called episiotomy, a surgical incision of the birth canal, performed during labor to widen the passage for the fetus's head to pass through. Perineal tears can be categorized into four different degrees. The first-degree tear is characterized by a laceration limited to the fourchette and superficial perineal skin or vaginal mucosa. Conversely, second-degree tears involve perineal muscles without affecting the anal sphincter. Moving on, the third degree of perineal tears encompasses the anal sphincter complex, which includes both the external anal sphincter (EAS) and the internal anal sphincter (IAS). Lastly, fourth-degree tears extend to the anal sphincter complex (EAS and IAS) as well as the rectal mucosa (Cunningham et al, 2018).

There are many risk factors for perineal trauma. Primarily, the rapid distension of the perineum in cases of precipitate labor is noteworthy. Subsequently, excessive stretching of the perineum due to prolonged second stage, a large fetus (>4 kg), a deflexed head, occipito-posterior position, face presentation, shoulder dystocia, and a contracted pelvis are significant risk factors. Thirdly, factors such as an inelastic or rigid perineum, particularly in nulliparous women, those with scarred perineum, or victims of female genital mutilation, contribute to the risk. Furthermore, the consequences of genital trauma are categorized into short- and long-term effects. Short-term effects encompass hemorrhage and heightened blood loss, edema at the injury site, infections, damage to the anal

sphincter and rectal mucosa, urethral and bladder injuries, hematoma formation, and perineal discomfort. On the other hand, long-term effects include chronic infections, anorectal dysfunction, fecal and urinary incontinence, pelvic organ prolapse, as well as sexual dysfunction (Abedzadeh-Kalahroudi et al., 2019; Faraz et al., 2022).

Midwives are in a unique position to enhance the well-being of parturient women and help them achieve positive outcomes in the second stage of labor by incorporating different interventions and techniques. The most common methods that can be used to maintain and promote perineal integrity are perineal warm compresses and the breathing technique of blowing (Rodrigues et al., 2023).

The breathing technique of blowing introduced the psycho-prophylactic method that helps in the preparation of natural childbirth (Abo-Bakr and Salah, 2020). It also helps reduce cortisol levels and the production of endorphins by stimulating the parasympathetic nervous system. Breathing as a relaxation technique involves an endocrine physiological and neurological mechanism that connects the mind and body, which has positive effects on the physical, psychological, and social dimensions of women. During relaxation, the neuromodulator property of oxytocin decreases the activity of the sympathetic and autonomic nervous systems, which reduces the levels of the stress hormones adrenaline and noradrenaline. Further decline of stress hormones like corticotrophin-releasing hormone, adrenocorticotropic hormone, beta-endorphins, and cortisol is due to inactivation of the hypothalamic-pituitary-adrenal pathway (LoMauro and Aliverti, 2015).

Respiration includes activation of voluntary (cortex) and involuntary (emotional, metabolic, neural, and endocrine components) control mechanisms. In addition, breathing is influenced and stimulated by several hormones, such as progesterone, which increases ventilation by increasing respiratory center sensitivity to carbon dioxide. Gentle pushing and breath holding during pushing are practiced during the second stage of labor. This helps sustain bearing down at regular intervals, enhances fair oxygen

supply to the baby, and reduces fatigue. Breathe hold during pushing increases the intensity and strength of the bearing-down efforts. Accordingly, blowing is considered a feasible method for mitigating perineal damage and diminishing the abdominal pressure exerted during uterine contractions. (Ibrahim et al., 2017).

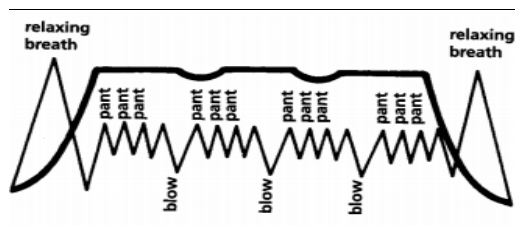


Fig (1) : breathing technique of blowing (Cura Advanced Physiotherapy Centers, 2024)

Perineal warm compresses applied during the second stage of labor have been suggested as a method to decrease the occurrence of perineal lacerations. The application of perineal warm compresses in this stage induces vasodilation of the vessels, resulting in enhanced blood circulation, decreased discomfort, muscle relaxation, improved muscle elasticity, and heightened maternal comfort (Sun et al., 2024).

Significance of the study

Perineal trauma represents a significant health concern with implications for the long-term well-being of women, encompassing physical, mental, and social dimensions. The ongoing debate surrounding the efficacy of utilizing blowing as opposed to warm compresses in the second stage of labor for maintaining perineal integrity and reducing the occurrence and severity of tears among primiparous women underscores the need for further research. Consequently, the present study aimed to evaluate the effect of blowing versus warm compresses on birth outcomes in primiparous women during the second stage of labor.

Aim of the study

This study aimed to:

Determine the effect of the breathing technique of blowing versus perennial warm compresses during the second stage of labor on birth outcomes among primipara.

Research hypotheses

- Parturient women who practice breathing technique (blowing) during the second stage of labor experience lower adverse perineal integrity than those who receive perineal warm compresses.
- Parturient women who practice breathing technique (blowing) during the second stage of labor exhibit a shorter duration of the second stage than those who receive perineal warm compresses.
- Parturient women who practice breathing technique (blowing) during the second stage of labor exhibit a normal progress of labor than those who receive perineal warm compresses.

Operational definitions

Birth outcomes in this study refer to:

- **Maternal outcomes include** duration of the second stage of labor, progress of labor as well as perineal condition (intact, episiotomy) or occurrence of perineal tears, and their degrees.
- **Fetal outcomes include** the Apgar score at one and five minutes as well as the presence or absence of fetal birth injuries or complications.

Materials and Methods

Materials

I-Research design:

A quasi-experimental research design was employed to investigate a possible cause and effect relationship between the independent and dependent variables, without the random assignment of participants.

II-Setting:

The study took place at the labor and delivery unit at Rashid General Hospital, affiliated to the Ministry of Health. This particular setting was chosen due to its acceptable turnover rate and its facilities, including 10 beds for the first stage of labor and two delivery rooms. Moreover, it provides healthcare services to numerous adjacent villages and towns.

Subjects:

The study included 60 parturient women selected through a convenience sampling method

from the aforementioned setting. The inclusion criteria were as follows:

- Age ranges from 20 to 35 years.
- Full-term pregnancy lasting between 37-42 weeks with a normal gestational progression.
- Body mass index not exceeding 30.
- Parturient women during the active phase of the first stage of labor with singleton pregnancy in cephalic presentation and fulfilled the criteria of vaginal delivery without contraindications.
- Fetal heart rate ranging from 120–160 beats per minute.
- Willing to participate in the study.

The sample size was determined using Epi-Info software with the following parameters:

- Population size is 630/3 months
- Expected frequency of 50%
- Acceptable error of 10%
- Confidence coefficient of 95%

- The minimum required sample size is 59 women.

- The final sample size is 60 women.

The participants were evenly distributed into two groups, with 30 individuals in each group as follows:

- Blowing technique group who performed the breathing technique of blowing.
- Warm compresses group who received perineal warm compresses.

Sample recruitment

Women in both groups were assigned based on their attendance at the study setting to prevent the test effect. The first woman was allocated to the blowing technique group, and the second to the perineal warm compresses group. A total of 75 eligible parturient women were asked to join the study. Six women declined due to discomfort with the techniques, and nine did not meet the criteria, resulting in the exclusion of 15 participants. This left 60 eligible women, with 30 in each group for the two interventions. Statistical analysis was carried out on the 60 subjects. A flowchart illustrating the study groups is shown in Figure 2.

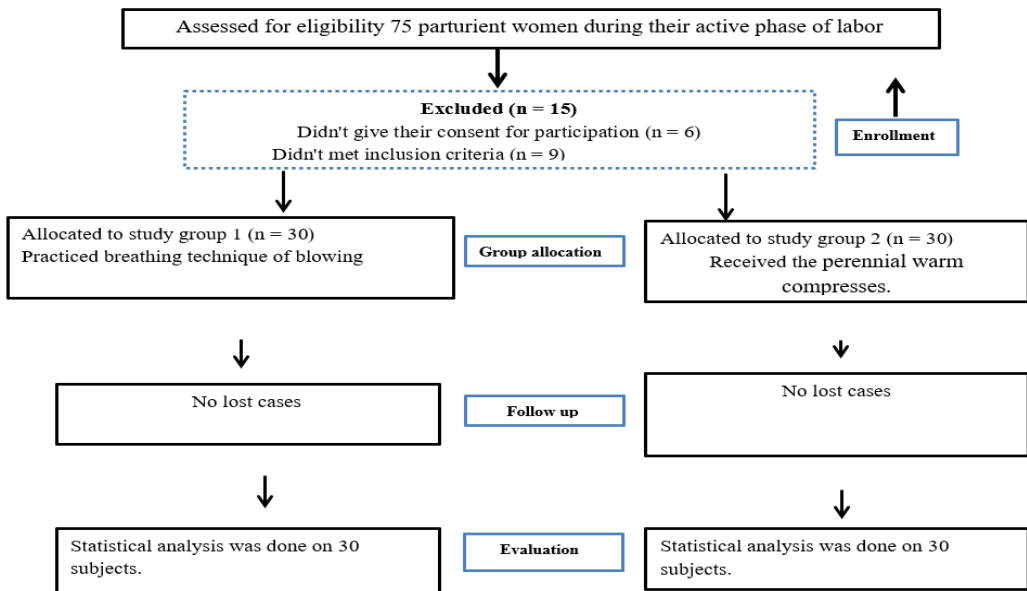


Figure 2. Flowchart of the study groups

IV-Tools:

Two tools were used to collect the necessary data in the current study:

Tool (I): Socio-demographic and clinical data structured interview schedule:

It was developed by the researchers and guided by Gaheen and Abo-Hatab (2021) to collect the following data:

1.Socio-demographic characteristics such as age, level of education, occupation, current residence, family income/month, as well as age at marriage.

2.Reproductive history: such as gravidity and number of abortions.

3.History of the current pregnancy, such as weeks of gestation, planning of the current pregnancy, attending the initial visit, and total number of antenatal visits.

4.Clinical assessment: It included vital signs and fetal heart rate in addition to maternal height and weight to calculate body mass index (BMI).

Tool II: Birth outcome assessment sheet.

It was developed by the researcher and guided by Sarhan et al (2022). It entailed three parts:

Part 1: Second-stage parameters: it included the duration of the second stage of labor, and the progress of labor.

Part II: Assessment of perineal condition (either intact, indication for episiotomy, occurrence of perineal tears, and their degree).

Part III: Neonatal Birth Outcomes: It included the Apgar score at the first and fifth minutes as well as the presence or absence of fetal complications as well as birth injuries.

METHOD

The study was conducted according to the following steps:

1-Administrative step

- Approval was obtained from the Research Ethics Committee, Faculty of Nursing, Alexandria University.

- Official letters from the vice dean of graduate studies and research, Faculty of Nursing, Alexandria University were directed to the responsible authority of the study setting to obtain permission to collect data after explaining the purpose of the study.

2-Tools development phase:

- Upon thorough review of pertinent literature, the researchers developed tools (I, II).

- Subsequently, the tools underwent validation by a panel of three experts in the respective field, taking into account their feedback and suggestions.

- The reliability of the tools was assessed through the internal consistency test (Cronbach's α), yielding a reliable result (0.863 for tool I and 0.844 for tool II).

3. A pilot study

A pilot study was conducted involving six primiparous women to ensure the clarity and practicality of the tools to identify potential obstacles, estimate the required data collection time, and address any necessary modifications. Participants in the pilot study were subsequently excluded from the main study sample.

4.The application of both techniques were conducted through the following phases:

I. Assessment phase:

- The researchers gave an appropriate explanation about the purpose of the study, the design, and the role of all primiparous women who were present in the first stage room. A written informed consent for participation in the study was obtained.

- The researcher proceeded to carry out individual interviews in complete confidentiality with every participant involved in the research during the active phase of the first stage of labor to gather basic data utilizing tool 1.

II. Implementation phase:

- At the beginning of the second stage of childbirth (when the cervix becomes fully dilated to expel the head of the fetus), The researchers performed the following for both study groups:

A. For the blowing technique group:

- **Step 1:** Each study subject was asked to close her eyes.

- **Step 2:** Each study subject was asked to relax her shoulders.

- **Step 3:** Each study subject was asked to take two deep abdominal breaths during the onset of uterine contraction, then take another deep breath and push for 4-5 seconds with an open glottis and controlled exhalation.

- **Step 4:** Each study subject was asked to repeat the previous process with each uterine contraction.

B. For warm compresses group:

The researcher applied warm compresses through the following steps:

- **Step 1:** A sterile container was filled with warm water with a temperature range of 38°C–44°C as measured by a water thermometer used especially for ascertaining the accurate temperature of hot and cold fluids and providing reliable measurement of temperature.

- **Step 2:** The researcher puts on sterile gloves.

- **Step 3:** A sterile perineal pad (gauze) was soaked in warm water and squeezed before being applied to the perineum area during each uterine contraction.

- **Step 4:** The researcher re-soaked the perineal gauze between each uterine contraction.

- **Step 5:** The researcher applied the warm compresses continuously until the fetal head is bulged.

- Data collection for the current study commenced in March 2023 and ended in August 2023. The study was carried out over a span of two days per week regularly. Initially, the researcher individually briefed each female participant regarding the study using uncomplicated language and elucidated the technique to be applied in the delivery room. Subsequently, the researcher conducted interviews with approximately 2 to 3 women per day in the delivery room, lasting for about two hours during the second and third stages of labor.

III. Evaluation phase:

- The researcher used tool II Part I during the second stage of labor to assess the progress of labor and duration of the second stage (min), where the condition of the perineum was assessed immediately after delivery through a visual inspection and examination of the genital tract using tool II Part II.

- The researcher used tool II Part III during the third stage of labor to assess the newborn's Apgar score at one and five minutes and the presence of any birth injuries or complications.

Statistical analysis:

The gathered data underwent categorization, coding, computerization, tabulation, and analysis utilizing the Statistical Package for Social Sciences (SPSS) version 23 software. Statistical techniques such as cross-tabulation were employed to depict and summarize the categorical variables of the two groups. Descriptive and analytical statistical methods such as percentages, mean, and standard deviation were utilized; meanwhile, Chi-square test, Fisher's Exact test, and t-test were employed to find out the difference in the results at a significance level of less than 0.05 (5%).

Ethical Considerations:

In this study, ethical considerations were carefully addressed for each recruited subject.

Firstly, the subjects' written informed consent was secured after a thorough explanation of the research purpose, ensuring that they fully understood the nature of their participation. Privacy measures were implemented to protect the identity and personal information of all study participants. Additionally, confidentiality protocols were strictly adhered to in order to maintain the privacy of the collected data.

- Participants were explicitly informed that their involvement in the study was voluntary and that they had the right to withdraw at any time without facing any consequences. This ensured that their autonomy and freedom of choice were respected throughout the research process.

Results:

According to parturient women's socio-demographic data, table (I) clarified that **the mean age** was 27.87 ± 3.794 & 26.70 ± 3.564 years for the blowing technique and warm compresses groups respectively. **Level of education** also revealed that more than one-half (53.3% & 56.7%) of the blowing technique and warm compresses groups respectively had secondary level or its equivalent; whereas more than one third (36.7% & 33.3%) of both groups respectively had university level. In addition, **occupation** indicated that almost three-fifths and more (56.7% & 63.3%) of the warm compresses and blowing technique groups respectively were working; while about two-fifths and more (36.7% & 43.3%) of the latter and the former groups respectively were housewives. However, 42.1% & 52.9% of working blowing technique and warm compresses groups respectively were employees; whilst 42.1% & 29.4% of them respectively were professionals.

Moreover, **current residence** showed that 60% & 43.3% of the blowing technique and warm compresses groups respectively were rural residents; while 56.7% & 40% of the latter and the former groups respectively were urban residents. Furthermore, the majority of the blowing technique and warm compresses groups (80%) had **nuclear family**; whereas all of them (100%) were living in an **uncrowded house**. Likewise, a sizeable proportion the blowing technique and warm compresses groups (66.7%

& 73.3%) **had no enough family income**. Finally, **the mean age at marriage** was 25.87 ± 3.550 & 24.67 ± 3.231 years for the blowing technique and warm compresses groups respectively. However, the two groups' socio-demographic data were almost similar, where no statistically significant differences were found between them.

Regarding parturient women's reproductive history, table (II) manifested that **the mean gravidity** was 1.47 ± 0.681 & 1.47 ± 0.629 pregnancies for the blowing technique and warm compresses groups respectively. However, three-fifths and more (60% & 63.3%) of the latter and the former groups respectively had no abortion. **Mean weeks of current gestation** were also 39.40 ± 0.675 & 39.13 ± 0.860 weeks for the blowing technique and warm compresses groups respectively. In addition, the vast majority of the blowing technique and warm compresses groups (93.3% & 90%) respectively had planned pregnancy. Moreover, a considerable proportion of the blowing technique and warm compresses groups (93.3% & 76.7%) respectively had their **initial AN visit** during the 1st trimester and (83.3% & 70%) of them respectively had 4 or more visits. Thereby, the relationship between the two groups' reproductive history was not statistically significant.

Concerning parturient women's clinical data, table (III) presented that the blowing technique and warm compresses groups' **mean BMI** was 30.121 ± 3.255 & 30.415 ± 3.290 respectively; **mean temperature** was 36.797 ± 0.326 & 36.847 ± 0.338 °C respectively; **mean pulse** was 81.03 ± 4.476 & 80.63 ± 5.986 b/m respectively; **mean respiration** was 17.30 ± 1.022 & 17.33 ± 1.583 breaths/m respectively; **mean systolic BP** was 114.13 ± 4.855 & 114.23 ± 5.289 mm Hg respectively; **mean diastolic BP** was 76.37 ± 4.287 & 77.03 ± 5.518 mm Hg respectively; **and mean FHR** was 134.73 ± 9.307 & 137.67 ± 10.367 b/m respectively. Nevertheless, the two groups were homogenous, where the relationship between their clinical data was not statistically significant.

Respecting maternal birth outcome, table (IV) illustrates that the difference between the two groups was not statistically significant as the mean duration of the 2nd stage of labor was 45.73

± 7.728 and 45.53 ± 10.602 among the blowing technique and warm compresses groups, respectively, and progress of labor was normal among most of them (93.4% and 96.7%), respectively. Nevertheless, the condition of the perineum elucidated that 93.4% of the warm compresses group had more intact perineum than the blowing technique group (60%), with a statistically significant difference between both groups ($P < 0.009$).

As for fetal birth outcome, table (V) demonstrated no statistically significant differences between the blowing technique and warm compresses groups, where most or almost all of them have normal Apgar scores after one minute (93.3% & 90.0%) respectively and after five minutes (100%); un-excessive molding and caput succedaneum; no cyanosis; and no need for O_2 resuscitation (93.3% & 90%), respectively; no birth injuries (100% & 96.7%); and normal O_2 saturation (93.3% & 96.7%), respectively.

Table (I): Distribution of parturient women according to their socio- demographic data (n=60)

| Socio - demographic data | Blowing Technique Group (30) | | Warm Compresses Group (30) | | t-test (P) F / χ^2 (P) |
|---|------------------------------|-------|----------------------------|-------|--------------------------------|
| | No | % | No | % | |
| Age (years): Min-Max Mean & SD | 20-35 27.87 \pm 3.794 | | 20-34 26.70 \pm 3.564 | | 1.231 (0.223) |
| Level of education: | | | | | |
| - Illiterate/read & write | 1 | 03.3 | 0 | 00.0 | 1.278 (0.734) |
| - Basic | 2 | 06.7 | 3 | 10.0 | |
| - Secondary or its equivalent | 16 | 53.3 | 17 | 56.7 | |
| - University | 11 | 36.7 | 10 | 33.3 | |
| Occupation: | | | | | |
| - Housewife | 11 | 36.7 | 13 | 43.3 | 0.278 (0.598) |
| - Working | 19 | 63.3 | 17 | 56.7 | |
| Type of work: | (n=19) | | (n=17) | | |
| - Professional | 8 | 42.1 | 5 | 29.4 | 1.846 (0.605) |
| - Employee | 8 | 42.1 | 9 | 52.9 | |
| - Worker | 0 | 00.0 | 1 | 05.9 | |
| - Merchant | 3 | 15.8 | 2 | 11.8 | |
| Current residence: | | | | | |
| - Rural | 18 | 60.0 | 13 | 43.3 | 1.669 (0.196) |
| - Urban | 12 | 40.0 | 17 | 56.7 | |
| Type of family: | | | | | |
| - Nuclear | 24 | 80.0 | 24 | 80.0 | - |
| - Extended | 6 | 20.0 | 6 | 20.0 | |
| Crowding index: | | | | | |
| - Uncrowded (<2) | 30 | 100.0 | 30 | 100.0 | - |
| Family income/ month: | | | | | |
| - Enough | 10 | 33.3 | 8 | 26.7 | 0.317 (0.573) |
| - Not enough | 20 | 66.7 | 22 | 73.3 | |
| Age at marriage (years): Min-Max Mean & SD | 19-33 25.87 \pm 3.550 | | 18-32 24.67 \pm 3.231 | | 1.369 (0.176) |

χ^2 (P): Chi-Square Test & P for χ^2 Test

F (P): Fisher Exact test & P for F Test

*: Significant at $P \leq 0.05$

Table (II): Distribution of parturient women according to their reproductive history (n=60)

| Reproductive history | Blowing Technique Group (30) | | Warm Compresses Group (30) | | t-test (P) F / χ^2 (P) |
|--|------------------------------|--------------|----------------------------|--------------|--------------------------------|
| | No | % | No | % | |
| Gravidity: Min-Max Mean & SD | 1-4 1.47 ± 0.681 | | 1-3 1.47 ± 0.629 | | - |
| Abortion: - 0 - 1-3 | 19 11 | 63.3 36.7 | 18 12 | 60.0 40.0 | 0.071 (0.790) |
| Weeks of current gestation: Min-Max Mean & SD | 38-40 39.40 ± 0.675 | | 37-40 39.13 ± 0.860 | | 1.353 (0.181) |
| Planning of current pregnancy: - Planned - Unplanned | 28 2 | 93.3 6.7 | 27 3 | 90.0 10.0 | 0.218 (0.640) |
| Time of initial AN visit: - 1 st trimester - 2 nd trimester | 28 2 | 93.3 6.7 | 23 7 | 76.7 23.3 | 3.268 (0.071) |
| No of AN visits: <4 4+ | 5 25 | 16.7 83.3 | 9 21 | 30.0 70.0 | 1.491 (0.222) |

χ^2 (P): Chi-Square Test & P for χ^2 Test

F (P): Fisher Exact test & P for F Test

*: Significant at P ≤ 0.05

Table (III): Mean distribution of parturient women according to their clinical data (n=60)

| Clinical data | Blowing Technique Group (30) | Warm Compresses Group (30) | t-test (P) |
|--------------------------------|-------------------------------|-------------------------------|----------------|
| | Min-Max Mean & SD | Min-Max Mean & SD | |
| BMI | 24.61-34.34 30.121 ± 3.255 | 24.03-34.11 30.415 ± 3.290 | 0.348 (0.729) |
| Temperature ° C | 36.5-37.5 36.797 ± 0.326 | 36.5-37.5 36.847 ± 0.338 | 0.583 (0.562) |
| Pulse (b/m) | 74-90 81.03 ± 4.476 | 66-88 80.63 ± 5.986 | 0.293 (0.770) |
| Respiration (breaths/m) | 15-19 17.30 ± 1.022 | 14-20 17.33 ± 1.583 | 0.087 (0.931) |
| Systolic BP (mm Hg) | 110-124 114.13 ± 4.855 | 110-126 114.23 ± 5.289 | 0.076 (0.939) |
| Diastolic BP (mm Hg) | 70-82 76.37 ± 4.287 | 68-88 77.03 ± 5.518 | 0.517 (0.607) |
| FHR (b/m) | 120-155 134.73 ± 9.307 | 120-165 137.67 ± 10.367 | 1.1563 (0.252) |

Table (IV): Number and percent distribution of parturient women according to their maternal birth outcome (n=60)

| Maternal birth outcome | Blowing Technique Group (30) | | Warm Compresses Group (30) | | t-test (P) F / χ^2 (P) |
|--|------------------------------|------|----------------------------|-------|--------------------------------|
| | No | % | No | % | |
| -Duration of the 2nd stage of labor (minutes): Min-Max Mean & SD | 30-60 45.73 ± 7.728 | | 30-65 45.53 ± 10.602 | | 0.083 (0.934) |
| -Normal progress of labor: | | | | | |
| - Yes | 28 | 93.4 | 29 | 96.7 | 0.351 (0.553) |
| - No | 2 | 06.6 | 1 | 03.3 | |
| - Condition of perineum: | | | | | |
| - Intact | 18 | 60.0 | 28 | 93.4 | 9.341 (0.009) * |
| - Episiotomy | 7 | 23.3 | 1 | 03.3 | |
| - Laceration/ perineal tear | 5 | 16.7 | 1 | 03.3 | |
| - Degrees of perineal tear | No = 5 | | No = 1 | | 0.6 (0.349) |
| - 1 st perineal tear | 3 | 60.0 | 1 | 100.0 | |
| - 2 nd perineal tear | 2 | 40.0 | 0 | 00.0 | |
| - 3 rd perineal tear | 0 | 00.0 | 0 | 00.0 | |

χ^2 (P): Chi-Square Test & P for χ^2 Test F (P): Fisher Exact test & P for F Test *: Significant at P ≤ 0.05

Table (V): Number and percent distribution of parturient women according to their fetal birth outcome (n=60)

| Fetal birth outcome | Blowing Technique Group (30) | | Warm Compresses Group (30) | | F / χ^2 (P) |
|-------------------------------------|------------------------------|-------|----------------------------|-------|------------------|
| | No | % | No | % | |
| Apgar score at 1 minute: | | | | | |
| - Normal (7-10) | 28 | 93.3 | 27 | 90.0 | 0.218 (0.640) |
| - Mild asphyxia (4-6) | 2 | 06.7 | 3 | 10.0 | |
| Apgar score at 5 minutes: | | | | | |
| - Normal (7-10) | 30 | 100.0 | 30 | 100.0 | - |
| FHR >160 b/m: | | | | | |
| - Yes | 0 | 00.0 | 2 | 06.7 | 2.069 (0.150) |
| - No | 30 | 100.0 | 28 | 93.3 | |
| FHR <100 b/m: | | | | | |
| - Yes | 2 | 06.67 | 1 | 03.3 | 0.351 (0.553) |
| - No | 28 | 93.3 | 29 | 96.7 | |
| Excessive molding: | | | | | |
| - Yes | 2 | 06.7 | 3 | 10.0 | 0.218 (0.640) |
| - No | 28 | 93.3 | 27 | 90.0 | |
| Excessive caput succedaneum: | | | | | |
| - Yes | 2 | 06.7 | 3 | 10.0 | 0.218 (0.640) |
| - No | 28 | 93.3 | 27 | 90.0 | |
| Need O2 resuscitation: | | | | | |
| - Yes | 2 | 06.7 | 3 | 10.0 | 0.218 (0.640) |
| - No | 28 | 93.3 | 27 | 90.0 | |
| Birth injuries: | | | | | |
| - Yes | 0 | 00.0 | 1 | 03.3 | 1.017 (0.313) |
| - No | 30 | 100.0 | 29 | 96.7 | |
| Cyanosis: | | | | | |
| - Yes | 2 | 06.67 | 3 | 10.0 | 0.218 (0.640) |
| - No | 28 | 93.33 | 27 | 90.0 | |
| Decreased O2 saturation: | | | | | |
| - Yes | 2 | 06.7 | 1 | 03.3 | 0.351 (0.553) |
| - No | 28 | 93.3 | 29 | 96.7 | |

χ^2 (P): Chi-Square Test & P for χ^2 Test F (P): Fisher Exact test & P for F Test *: Significant at P ≤ 0.05

Discussion

The estimated global birth rate in 2020 is calculated at 18.1 births per 1,000 individuals. Consequently, this translates to approximately 259 births occurring every minute across the globe, or equivalently, 4.3 births taking place per second (Central Intelligence Agency [CIA], 2021). The process of labor and birth itself, along with the fact that a new life is being born, make childbirth an important milestone in life. Moreover, this crucial period encompasses physical challenges such as perineal damage and loss of integrity. Women's overall health is negatively affected by perineal trauma, which is a serious health issue. Nevertheless, the prevention or reduction in the incidence of this problem has been largely overlooked in the realm of clinical research. Consequently, there is a scarcity of empirical data to substantiate interventions aimed at mitigating its impact. The objective of the present study was to examine the effect of employing the breathing technique of blowing in comparison to using warm compresses during the second stage of childbirth on birth outcomes among primipara (Abo-Bakr and Salah, 2020).

According to the results of the current study, it is evident that both groups were similar in almost all of their socio-demographic characteristics, clinical data, and reproductive histories (Tables I and II). This can be interpreted in light of the fact that most parturient women attending Rashid General Hospital are from the same socioeconomic class. Generally speaking, the consistent profile of the participants in this study helped to effectively control extraneous variables that could interfere with the effect of the interventions on birth outcomes. Additionally, it contributed to enhancing the credibility and significance of the findings obtained from the study.

Postpartum perineal injury carries substantial short- and long-term health effects for women. This study's results clearly implied that participants in the warm compress group exhibited a more preserved perineal condition compared to those in the blowing technique group, with a statistically significant difference between the two groups ($P = 0.009$). The results of this study may be linked to the positive effects

of perineal warm compresses on blood vessels' dilation and blood circulation during the second stage of labor, which in turn impact pain perception, collagen flexibility, and ultimately aid in relaxation as well as maintaining perineal integrity.

The results of this study align with the conclusions drawn by seven other researchers. Firstly, the Cochrane review provided evidence of moderate quality supporting the efficacy of warm compresses application during the second stage of labor in averting third- and fourth-degree perineal tears (Aasheim et al., 2017). Secondly, a systematic review indicated that the use of warm perineal compresses during the second stage of labor is linked to better perineal integrity in first-time mothers (Magoga et al., 2019). Thirdly, Türkmen et al. (2021) conducted a study that substantiated these findings by examining "The effect of perineal warm application on perineal pain, perineal integrity, and postpartum comfort in the 2nd stage of labor" through a randomized clinical trial in Turkey. Their findings indicated that utilizing warm compresses during vaginal delivery contributes to the preservation of perineal integrity. Fourthly, the findings of Modoor et al. (2021) align with the present research, as their study titled "The effect of warm compresses on perineal tear and pain intensity during the second stage of labor" demonstrated that the experimental group (receiving warm compresses) experienced lower levels of perineal tear post-intervention compared to the control group.

Fifthly, Ibrahim et al (2017) explored "the effect of warm compresses versus lubricated massage on perineal outcomes among primiparous women during the second stage of labor", their results indicated a significant difference between the warm compresses and lubricated massage groups in terms of maintaining perineal integrity, favoring the warm compresses group. Sixthly, Abdel Monem et al. (2020) found that both the hands-on and warm compresses groups exhibited higher rates of intact perineum compared to the hands-off group. Lastly, Sarhan et al. (2022) conducted a study titled "Effect of Warm Compresses Versus Lubricated Massage During the Second Stage of Labor on Perineal Integrity Among Primiparous

Women," revealing that both warm compresses and lubricated massage reduced the severity of perineal tears and episiotomy extension effectively when compared to the control group.

This agreement between the results of the previously mentioned studies and that of the current one is probably attributed to the fact that the perineal warm compresses can help in relaxation, reduce muscular spasms, and increase blood vessels' dilation, which can improve blood flow in the tissue around the compressed region. As a result, the ischemia in the tissue is reduced, and finally the perineal integrity is maintained.

In contrast, the present findings are not in line with Ahmadi et al. (2017) who investigated the "effect of the breathing technique of blowing on the extent of damage to the perineum at the moment of delivery: a randomized clinical trial". They declared that the intact perineum was more frequently observed in the intervention group, with a statistically significant difference between the two groups ($P = 0.002$). Their results were attributed to the technique of blowing during childbirth which facilitates a gradual stretching of perineal muscles through a slower and controlled descent of the fetus. Moreover, the act of pushing only when an uncontrollable urge is felt diminishes pressure on the perineal region, ensuring pressure is exerted solely after the fetus has initiated its descent. This discrepancy may be ascribed to variations in study methodologies, sample sizes, and variables.

Regarding the progress of labor, the present study findings unveiled that the progress of labor was normal among the majority of both studied groups, without any statistically significant difference between them ($p = 0.553$). The study findings align with the previously mentioned study by Ibrahim et al (2017), illustrating that the application of perineal warm compresses and perineal lubricated massage during the 2nd stage of labor had a greater positive impact on the progress of labor than the control group. Additionally, the study titled "Effect of Utilizing Perineal Massage, Warm Compresses and Hands on Techniques during the Second Stage of Labor on Perineal Outcomes" which was conducted in Tanta by Gaheen and Abo-Hatab (2021) deduced that a considerable rise was evident in the proportion of women who

exhibited labor progress among the three study groups in comparison to the control group, indicating a statistically significant difference among them.

Concerning the mean duration of the second stage of labor, the current findings revealed that the mean duration of the second stage of labor falls within the normal range among the two studied intervention groups. This finding may be attributed to the perineal warm compress, which may improve the blood supply to the perineal area and enhance elasticity and relaxation. Furthermore, in the breathing technique the exhalation and blowing serve to alleviate the heightened pressure caused by uterine contractions and the abdominal pressure experienced during the pushing stage. Additionally, the gradual expansion or dilation of the muscles is solely attributed to the pushing facilitated by the descent of the fetal head. These findings are consistent with a previously mentioned study by Sarhan et al (2022), where their results revealed that warm compresses and lubricated massage effectively reduced the duration of the second stage of labor compared to the control group. On the other hand, the results of the present study disagreed with those of Ganji et al. (2013), who conducted a randomized controlled trial to evaluate "the effectiveness of local heat and cold compresses on labor pain and labor outcomes". The researchers conveyed that the utilization of a warm towel on the perineum did not yield any discernible impact on the duration of the second stage of labor. Discrepancies between the aforementioned study and the present one might be attributed to variations in research contexts and objectives.

Concerning the fetal birth outcomes, the findings of the present study demonstrated no statistically significant differences between the blowing technique and warm compress groups, where most or almost all of them have a normal Apgar score after one and five minutes with no fetal birth injuries or associated complications. This result suggests a possible positive effect of both interventions on fetal birth outcomes. The findings of the current study are compatible with the previously mentioned study by Gaheen and Abo-Hatab (2021). They stated that the mean Apgar scores fell within the normal range among

the four study groups. Furthermore, this study aligns with Lee et al. (2019), who conducted a study entitled "Combined massage and warm compress to the perineum during the active second stage of labor in nulliparas." The researchers concluded that the mean newborn Apgar scores were within the normal range among the intervention groups. Goswami et al. (2022) conducted another study that revealed an increase in fetal heart rate after administering perineal heat. Moreover, all infants exhibited optimal health conditions without any adverse impacts observed on either the infants or the mothers. They reported that after perineal heat application, there was an increase in fetal heart rate, and all the newborns were healthy, with no harmful effects on newborns or mothers.

Conclusion:

This study concluded that both the blowing breathing technique and the warm compresses application yield positive effects on birth outcomes in terms of the progress of labor, the duration of the second stage of labor, and fetal birth outcomes. However, the application of perineal warm compresses demonstrates a greater positive effect compared to the blowing breathing technique concerning perineal integrity.

Recommendation

Based on the findings of this study, the following recommendations are suggested:

- In-service training programs should be carried out for intrapartum health care providers to increase their awareness about the positive effects of the perennial warm compresses as a perineal-protecting technique.

- Hospitals should offer the breathing technique of blowing and perineal warm compresses as part of standard intrapartum care.

- Assessment of parturient women's satisfaction with the practice of the breathing technique of blowing and the application of perennial warm compresses during the second stage of labor.

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